

### **REMARKS**

Claims 1-15, 17-21, and 23-29 were presented for examination and were rejected. Claims 23, 24 have been canceled. The scope of claims 1-15, 17-21, 23, and 26 have been amended to more clearly distinguish the present invention from the prior art. Claims 27-29 remain unamended.

The applicants respectfully request reconsideration in light of the amendments and the following comments.

#### **35 U.S.C. 112 Rejection of Claims 15, 19, 21, and 25**

Claims 15, 19, 21, and 25 have been rejected under 35 U.S.C. 112, Second Paragraph.

Claim 15 was rejected because it was not clear that the angle of incidence was restricted to two dimensions. Claim 15 has been amended to recite that the angle of incidence is based on two vectors. Two vectors define a plane, and, therefore, the applicant respectfully submits that the rejection is overcome.

Claims 19 and 25 were rejected because the recitation of a difference of two vectors was not consistent with the specification. Claim 19 has been amended to recite the "angular difference" between two vectors, which is consistent with the specification. Claim 25 has been canceled. For this reason, the applicant respectfully submits that the rejection is overcome.

Claim 21 was rejected because the phrase "estimate of signal attenuation is based on signal losses at a first group of said rasters" is vague and indefinite. The applicants disagree, but the claim has been amended and no longer contains the limitation.

Claims 15 and 21 were rejected because the phrase "surface vector" could also mean a vector normal to the surface and is therefore indefinite. The applicants agree with the Office that indeed the surface vector, as recited in claims 15 and 21, can be (1) normal to the surface at the point of incidence, or (2) parallel to the surface at the point of incidence. This does not, however, make the phrase indefinite. On the contrary, as the Office has astutely pointed out, the phrase is quite definite.

An un-modified "surface vector" is a genus of vectors. A "normal surface vector" is a species of "surface vector," as is a "parallel surface vector." Claims 19 and 25 recite the genus surface vector. The fact that a genus of a limitation is recited in a claim does not

make the genus vague or indefinite. There is no prohibition in law against reciting a genus in a claim, and, therefore, the applicant respectfully submits that the rejection is traversed.

**35 U.S.C. 103 Rejection of Claims 1-2, 7-10, 13, and 27**

Claims 1-2, 7-10, 13, and 27 were rejected under 35 U.S.C. 103(a) as being unpatentable over P. Bahl et al., U.S. Patent 6,799,047 (hereinafter Bahl I" in view of T.S. Rappaport et al., U.S. Patent 6,850,946 (hereinafter "Rappaport"). Claims 1-2, 7-10, and 13 have been amended to more clearly distinguish the present invention from the prior art. The applicants respectfully submit that the claims, as amended, overcome the rejection.

Claim 1, as amended, recites:

**1.** A method comprising:  
estimating the signal attenuation of a signal between a first location and a second location due to a building based ***directly*** on a raster ***footprint*** of said building;  
wherein said first location is within said building and said second location is outside of said building.  
(*emphasis supplied*)

There are two fundamental distinctions between the present invention and the prior art:

First, nowhere does Bahl or Rappaport teach or suggest, alone or in combination with the other references, what claim 1 recites – namely estimating the signal attenuation based on a raster ***footprint*** of the building. ***As shown in Figure 9 of the present invention, this is surface space occupied by a building in silhouette.***

The Office's Response to the last amendment argues at length about the differences between vector and raster formats, but this is, to some degree, beside the point. Neither Bahl nor Rappaport teach or suggest the estimating of the signal attenuation on a building ***footprint*** regardless of the format.

Second, nowhere does Bahl or Rappaport teach or suggest, alone or in combination with the other references that the signal attenuation is based ***directly*** on the raster footprint of the building. This makes the invention very useful because it enables an aerial or satellite photograph of the footprint of a building to be easily and directly turned into estimates of signal attenuation.

For this reason, the applicants respectfully submit that the rejection of claim 1 is traversed.

Because claims 2, 7-10, and 13 depend on claim 1, the applicants respectfully submit that the rejection of them is also overcome.

Claim 27 recites:

**27. (Previously Presented)** A method for estimating a location of a wireless terminal, said method comprising:

accessing **an outdoor radio frequency database**, wherein said outdoor radio frequency database provides signal strength as a function of location; and

**modifying said signal strength, as provided by said outdoor radio frequency database, with signal-attenuation values from an indoor radio frequency database**, wherein said indoor radio frequency database provides signal attenuation, as determined by a raster map of said structure, as a function of location within a structure.

**(emphasis added)**

Nowhere does Bahl or Rappaport teach or suggest (1) an outdoor radio frequency database and (2) modifying the outdoor radio frequency database with values from an indoor radio frequency database. For this reason, the applicants respectfully submit that the rejection of claim 27 is overcome.

### **35 U.S.C. 103 Rejection of Claims 14 and 28-29**

Claims 14 and 28-29 were rejected under 35 U.S.C. 103(a) as being unpatentable over P. Bahl et al., U.S. Patent 6,799,047 (hereinafter "Bahl I" in view of T.S. Rappaport et al., U.S. Patent 6,850,946 (hereinafter "Rappaport") and further in view of M. Motamedi, U.S. Patent 6,985,839 (hereinafter "Motamedi"). The applicants respectfully submit that the claims, as amended, overcome the rejection.

Claim 14 depends on independent claim 1, and Motamedi fails to cure deficiencies of Bahl and Rappaport with regard to claim 1.

The Office cites Col. 5 lines 5-13 to support the contention that Motamedi teaches using signal-attenuation values from an indoor radio frequency database to modify the signal-strength values in an outdoor database. A careful reading of the cited portion of the reference makes it perfectly clear that this is incorrect. Motamedi states:

Multipath pattern recognition is an approach which is not immediately related to TDOA, however it is often combined with AOA to improve its performance. Multipath pattern recognition entails comparing the signature of the signal received at various sensor sites with the that stored in a **substantial data base** containing the signatures created during extensive calibration runs spanning the area. Pattern recognition and classification algorithms are used to obtain the best match and the location.

This technique is better suited to long calls or mobile calls where a significant amount of filtering can be applied to discard erroneous matches.

Motamedi Col. 5, lines 5-13 (***emphasis supplied***)

There is only one "database" mentioned in this paragraph, not two as recited in the claim. For this reason, the applicant respectfully submits that the rejection of claim 14 is traversed.

Claims 28 and 29 depend on independent claim 27 and Motamedi fails to cure the deficiencies of Bahl and Rappaport with regard to claim 27. For this reason, the applicant respectfully submits that the rejection of claims 28 and 29 is overcome.

### **35 U.S.C. 103 Rejection of Claims 4-6, 12, and 20**

Claims 4-6, 12, and 20 were rejected under 35 U.S.C. 103(a) as being unpatentable over P. Bahl et al., U.S. Patent 6,799,047 (hereinafter "Bahl I" in view of T.S. Rappaport et al., U.S. Patent 6,850,946 (hereinafter "Rappaport") and further in view of H. Baranger, U.S. Patent 6,119,009 (hereinafter "Baranger"). The applicants respectfully submit that the claims, as amended, overcomes the rejection.

Claims 4-6 and 12 on independent claim 1, and Baranger fails to cure deficiencies of Bahl and Rappaport with regard to claim 1. The Office cites Col. 4, lines 47-49 of Baranger for teaching "estimating signal attenuation comprises account for an effect of building orientation .... a said first group of rasters." Coincidentally, the current applicant's attorney, Jason Paul DeMont, wrote that application, and a careful reading of it shows that Baranger does not teach accounting for building orientation nor does it teach a group of rasters. Baranger states:

Separate estimates of reflection are advantageously made for both the interior walls and for the exterior walls so that the typical disparity in their construction can be considered.

Baranger Col. 4, lines 47-49

Nowhere does this text even mention the topic building orientation. For this reason, the applicant respectfully submits that the rejection of claims 4-6 and 12 are overcome.

Claim 20 depends on independent claim 15 and Baranger fails to cure deficiencies of Bahl and Rappaport with regard to claim 15. Claim 15 recites:

**15. (Currently Amended)** A method comprising:

- estimating the signal attenuation of a signal between a first location and a second location due to a building based on a raster **footprint** of said building;
- wherein said first location is within said building and said second location is outside of said building;
- wherein said raster footprint of said building comprises a boundary, a plurality of exterior rasters, and a plurality of interior rasters; and
- wherein ***estimating the signal attenuation of said signal comprises estimating an angle of incidence between (i) a signal vector between said first location and said second location, and (ii) an estimate of a surface vector of a first raster where said signal vector intersects said boundary.***

***(emphasis supplied)***

Nowhere does Bahl or Rappaport or Baranger teach or suggest, alone or in combination with the other references, what is recited in claim 15 — namely, the raster footprint and the estimation based on the angle of incidence. For these reasons, the applicants respectfully submit that the rejection of claim 20 is overcome.

**35 U.S.C. 103 Rejection of Claims 15, 17-19, 21, and 24-26**

Claims 15, 17-19, 21, and 24-26 were rejected under 35 U.S.C. 103(a) as being unpatentable over P. Bahl et al., U.S. Patent 6,799,047 (hereinafter "Bahl I" in view of T.S. Rappaport et al., U.S. Patent 6,850,946 (hereinafter "Rappaport") and further in view of H. Baranger, U.S. Patent 6,119,009 (hereinafter "Baranger") and further in view of Egbert et al., IEEE Computer Graphics and Applications, July 1996 (hereinafter "Egbert"). The applicants respectfully submit that the claims, as amended, overcome the rejection.

Claim 15 recites:

**15. (Currently Amended)** A method comprising:

estimating the signal attenuation of a signal between a first location and a second location due to a building based on a raster **footprint** of said building;

wherein said first location is within said building and said second location is outside of said building;

wherein said raster footprint of said building comprises a boundary, a plurality of exterior rasters, and a plurality of interior rasters; and

wherein ***estimating the signal attenuation of said signal comprises estimating an angle of incidence between (i) a signal vector between said first location and said second location, and (ii) an estimate of a surface vector of a first raster where said signal vector intersects said boundary.***

***(emphasis supplied)***

Nowhere does Bahl or Rappaport or Baranger or Egbert teach or suggest, alone or in combination with the other references, what is recited in claim 15 — namely, the raster footprint and the estimation based on the angle of incidence. For these reasons, the applicants respectfully submit that the rejection of claim 15 is overcome.

Because claims 17-19 depend on claim 15, the applicant respectfully submits that the rejection of them is also overcome.

Claim 21 recites:

**21. (Currently Amended)** A method comprising:

estimating the signal attenuation of a signal between a first location and a second location due to a building based on a raster **footprint** of said building;

wherein said first location is within said building and said second location is outside of said building;

wherein said raster footprint of said building comprises a boundary, a plurality of exterior rasters, and a plurality of interior rasters; and

wherein ***estimating the signal attenuation of said signal due to said building comprises estimating an angle of incidence between (i) a signal vector between said first location and said second location, and (ii) an estimate of a surface vector of a first raster in said plurality of interior rasters that intersects said signal vector.***

***(emphasis supplied)***

Nowhere does Bahl or Rappaport or Baranger or Egbert teach or suggest, alone or in combination with the other references, what is recited in claim 21 — namely, the raster footprint and the estimation based on the angle of incidence. For these reasons, the applicants respectfully submit that the rejection of claim 21 is overcome.

Claims 24 and 25 have been canceled. Claim 26 depends on claim 21, and, therefore, the applicants respectfully submit that the rejection of claim 26 is overcome.

**35 U.S.C. 103 Rejection of Claims 3 and 11**

Claims 3 and 11 were rejected under 35 U.S.C. 103(a) as being unpatentable over P. Bahl et al., U.S. Patent 6,799,047 (hereinafter "Bahl I" in view of T.S. Rappaport et al., U.S. Patent 6,850,946 (hereinafter "Rappaport") and further in view of Bahl et al. (IEEE INFOCOM 2000 (hereinafter "Bahl II"). The applicants respectfully submit that the claims, as amended, overcomes the rejection.

Claims 3 and 11 depends on claim 1 and Bahl II fails to cure the deficiencies of Bahl I and Rappaport with regard to claim 1. For this reason, the applicant respectfully submits that the rejection of claims 3 and 11 are overcome.

**35 U.S.C. 103 Rejection of Claim 23**

Claim 23 were rejected under 35 U.S.C. 103(a) as being unpatentable over P. Bahl et al., U.S. Patent 6,799,047 (hereinafter "Bahl I" in view of T.S. Rappaport et al., U.S. Patent 6,850,946 (hereinafter "Rappaport") and further in view of H. Baranger, U.S. Patent 6,119,009 (hereinafter "Baranger") and further in view of Egbert et al., IEEE Computer Graphics and Applications, July 1996 (hereinafter "Egbert") and further in view of Bahl et al. (IEEE INFOCOM 2000 (hereinafter "Bahl II"). The applicants respectfully submit that the claims, as amended, overcomes the rejection.

Claim 23 depends on claim 21 and Bahl II fails to cure the deficiencies of Bahl I and Rappaport and Baranger and Egbert with regard to claim 21. For this reason, the applicant respectfully submits that the rejection of claim 23 is overcome.

**35 U.S.C. 103 Rejection of Claims 15 and 21**

Claims 15 and 21 were rejected under 35 U.S.C. 103(a) as being unpatentable over P. Bahl et al., U.S. Patent 6,799,047 (hereinafter "Bahl I" in view of Klepal (Czech Technical University Press (hereinafter "Klepal") and further in view of Egbert et al., IEEE Computer Graphics and Applications, July 1996 (hereinafter "Egbert"). The applicants respectfully submit that the claims, as amended, overcomes the rejection.

Claim 15 recites:

**15. (Currently Amended)** A method comprising:

estimating the signal attenuation of a signal between a first location and a second location due to a building based on a raster **footprint** of said building;

wherein said first location is within said building and said second location is outside of said building;

wherein said raster footprint of said building comprises a boundary, a plurality of exterior rasters, and a plurality of interior rasters; and

wherein ***estimating the signal attenuation of said signal comprises estimating an angle of incidence between (i) a signal vector between said first location and said second location, and (ii) an estimate of a surface vector of a first raster where said signal vector intersects said boundary.***

***(emphasis supplied)***

Nowhere does Bahl or Klepal or Egbert teach or suggest, alone or in combination with the other references, what is recited in claim 15 — namely, the raster footprint and the estimation based on the angle of incidence. For these reasons, the applicants respectfully submit that the rejection of claim 15 is overcome.

Claim 21 recites:

**21. (Currently Amended)** A method comprising:

estimating the signal attenuation of a signal between a first location and a second location due to a building based on a raster **footprint** of said building;

wherein said first location is within said building and said second location is outside of said building;

wherein said raster footprint of said building comprises a boundary, a plurality of exterior rasters, and a plurality of interior rasters; and

wherein ***estimating the signal attenuation of said signal due to said building comprises estimating an angle of incidence between (i) a signal vector between said first location and said second location, and (ii) an estimate of a surface vector of a first raster in said plurality of interior rasters that intersects said signal vector.***

***(emphasis supplied)***

Nowhere does Bahl or Klepal or Egbert teach or suggest, alone or in combination with the other references, what is recited in claim 21 — namely, the raster footprint and the estimation based on the angle of incidence. For these reasons, the applicants respectfully submit that the rejection of claim 21 is overcome.



**Request for Reconsideration Pursuant to 37 C.F.R. 1.111**

Having responded to each and every ground for objection and rejection in the Office action mailed June 15, 2006, applicants request reconsideration of the instant application pursuant to 37 CFR 1.111 and request that the Examiner allow all of the pending claims and pass the application to issue.

Should there remain unresolved issues the applicant respectfully requests that Examiner telephone the applicants' attorney at 732-578-0103 x11 so that those issues can be resolved as quickly as possible.

Respectfully,  
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